

<1> The Commutative Properties

Use the commutative property of addition to rewrite each expression. See Example 1.

7. $9 + r$ 8. $t + 6$ 9. $3(2 + x)$
 10. $P(1 + rt)$ 11. $4 - 5x$ 12. $b - 2a$

Use the commutative property of multiplication to rewrite each expression. See Example 2.

13. $x \cdot 6$ 14. $y \cdot (-9)$ 15. $(x - 4)(-2)$
 16. $a(b + c)$ 17. $4 - y \cdot 8$ 18. $z \cdot 9 - 2$

<2> The Associative Properties

Use the commutative and associative properties of multiplication and exponential notation to rewrite each product. See Example 3.

19. $(4w)(w)$ 20. $(y)(2y)$ 21. $3a(ba)$
 22. $(x \cdot x)(7x)$ 23. $(x)(9x)(xz)$ 24. $y(y \cdot 5)(wy)$

Evaluate by finding first the sum of the positive numbers and then the sum of the negative numbers. See Example 4.

25. $8 - 4 + 3 - 10$
 26. $-3 + 5 - 12 + 10$
 27. $8 - 10 + 7 - 8 - 7$
 28. $6 - 11 + 7 - 9 + 13 - 2$
 29. $-4 - 11 + 7 - 8 + 15 - 20$
 30. $-8 + 13 - 9 - 15 + 7 - 22 + 5$
 31. $-3.2 + 2.4 - 2.8 + 5.8 - 1.6$
 32. $5.4 - 5.1 + 6.6 - 2.3 + 9.1$

<3> The Distributive Property


Use the distributive property to remove the parentheses. See Example 5.

33. $3(x - 5)$ 34. $4(b - 1)$
 35. $a(2 + t)$ 36. $b(a + w)$
 37. $-3(w - 6)$ 38. $-3(m - 5)$
 39. $-4(5 - y)$ 40. $-3(6 - p)$
 41. $-1(a - 7)$ 42. $-1(c - 8)$
 43. $-1(t + 4)$ 44. $-1(x + 7)$

Use the distributive property to factor each expression. See Example 6.


45. $2m + 12$ 46. $3y + 6$
 47. $4x - 4$ 48. $6y + 6$

49. $4y - 16$
 51. $4a + 8$
 53. $x + xy$
 55. $6a - 2b$

-  50. $5x + 15$
 52. $7a - 35$
 54. $a - ab$
 56. $8a + 2c$



<5> The Inverse Properties

Find the multiplicative inverse (reciprocal) of each number. See Example 7.

57. $\frac{1}{2}$ 58. $\frac{1}{3}$ 59. -5
 60. -6 61. 7  62. 8
 63. 1 64. -1 65. -0.25
 66. 0.75 67. 2.5 68. 3.5

<6> Identifying the Properties

Name the property that justifies each equation. See Example 8.

69. $3 \cdot x = x \cdot 3$
 70. $x + 5 = 5 + x$
 71. $2(x - 3) = 2x - 6$
 72. $a(bc) = (ab)c$
 73. $-3(xy) = (-3x)y$
 74. $3(x + 1) = 3x + 3$
 75. $4 + (-4) = 0$
 76. $1.3 + 9 = 9 + 1.3$
 77. $x^2 \cdot 5 = 5x^2$
 78. $0 \cdot \pi = 0$
 79. $1 \cdot 3y = 3y$
 80. $(0.1)(10) = 1$
 81. $2a + 5a = (2 + 5)a$
 82. $3 + 0 = 3$
 83. $-7 + 7 = 0$
 84. $1 \cdot b = b$
 85. $(2346)0 = 0$
 86. $4x + 4 = 4(x + 1)$
 87. $ay + y = y(a + 1)$
 88. $ab + bc = b(a + c)$

Complete each equation, using the property named.

89. $a + y = \underline{\hspace{2cm}}$, commutative property of addition
 90. $6x + 6 = \underline{\hspace{2cm}}$, distributive property
 91. $5(aw) = \underline{\hspace{2cm}}$, associative property of multiplication
 92. $x + 3 = \underline{\hspace{2cm}}$, commutative property of addition